

6. The apparatus of claim 1, wherein a lateral distance separating the first well and the second plug is greater than 12 micrometers (μm).

7. The apparatus of claim 6, wherein a lateral distance separating the first well and the second plug is greater than 15 μm .

8. The apparatus of claim 1, wherein the first plug has a doping concentration in a range between about 1×10^{15} per cubic centimeters ($1 \times 10^{15}/\text{cm}^3$) and about 5×10^{18} per cubic centimeters ($5 \times 10^{18}/\text{cm}^3$).

9. The apparatus of claim 1, wherein the protection device has a trigger voltage greater than about 100 V.

10. The apparatus of claim 9, wherein the protection device has a trigger voltage between about 100 V and about 200 V.

11. The apparatus of claim 1, wherein the protection device is disposed in a well defined by insulating side walls and an insulating layer, wherein the insulating side walls laterally surround the second plug, wherein the insulating layer is disposed underneath the buried layer and the second plug.

12. An apparatus comprising:

an internal circuit electrically coupled between a first node and a second node; and

a protection device electrically coupled between the first node and the second node, wherein the protection device is configured to protect the internal circuit from transient electrical events, the protection device comprising:

a buried layer having a doping of a first type;

a first plug disposed directly over the buried layer, and having a doping of the first type with a higher doping concentration than that of the buried layer, the first plug having an annular shape when viewed from above;

a first well disposed directly over the buried layer, and laterally surrounded by the first plug, the first well having a doping of the first type with a lower doping concentration than that of the first plug;

a second plug laterally surrounding the first plug, the second plug having a doping of a second type different from the first type;

a first region disposed at least in an end portion of the first well 520 opposite the buried layer, and electrically coupled to the first node, the first region having a doping of the second type with a higher doping concentration than that of the second plug; and

a second region disposed in a top portion of the second plug, and electrically coupled to the second node, the second region having a doping of the second type with a higher doping concentration than that of the second plug.

13. The apparatus of claim 12, wherein the first region, the second region, the first well, the first plug, and the second plug are configured to operate as a bipolar transistor when there is an overvoltage condition, and wherein the bipolar transistor is configured to have an emitter at the first region, a base at the first plug, and a collector at the second plug and the second region.

14. An apparatus comprising:

an internal circuit electrically coupled between a first node and a second node; and

a protection device electrically coupled between the first node and the second node, wherein the protection device is configured to protect the internal circuit from transient electrical events, the protection device comprising:

a buried layer having a doping of a first type;

a first plug overlying the buried layer, and having a doping of the first type with a higher doping concentration than that of the buried layer, the first plug having an annular shape when viewed from above;

a first well overlying the buried layer, and laterally surrounded by the first plug, the first well having a doping of the first type with a lower doping concentration than that of the first plug;

a second plug laterally surrounding the first plug, the second plug having a doping of a second type different from the first type;

a first region disposed in a top portion of the first well and electrically coupled to the first node, the first region having a doping of the second type with a higher doping concentration than that of the second plug;

a second region disposed in a top portion of the second plug, and electrically coupled to the second node, the second region having a doping of the second type with a higher doping concentration than that of the second plug; and

a diode array comprising one or more diodes connected in series between the first plug and the second region.

15. The apparatus of claim 14, wherein the diode array comprises first to n-th diodes, each of the diodes having an anode and a cathode, n being an integer equal to or greater than 1, wherein the anode of the first diode is electrically coupled to the first plug, and wherein the cathode of the n-th diode is electrically coupled to the second region.

16. The apparatus of claim 14, wherein the first region, the second region, the first well, the first plug, and the second plug are configured to operate as a bipolar transistor when there is an overvoltage condition, and wherein the bipolar transistor is configured to have an emitter at the first region, a base at the first plug, and a collector at the second plug and the second region.

17. An apparatus comprising:

an internal circuit electrically coupled between a first node and a second node; and

a protection device electrically coupled between the first node and the second node, wherein the protection device is configured to protect the internal circuit from transient electrical events, the protection device comprising:

a buried layer having a doping of a first type;

a first plug overlying the buried layer, and having a doping of the first type with a higher doping concentration than that of the buried layer, the first plug having an annular shape when viewed from above;

a first well overlying the buried layer, and laterally surrounded by the first plug, the first well having a doping of the first type with a lower doping concentration than that of the first plug;

a second plug laterally surrounding the first plug, the second plug having a doping of a second type different from the first type;

a first region disposed in a top portion of the first well and electrically coupled to the first node, the first region having a doping of the second type with a higher doping concentration than that of the second plug, wherein the first region is disposed in a top portion of the first well and at least in a portion of a top portion of the first plug; and

a second region disposed in a top portion of the second plug, and electrically coupled to the second node, the